

WHAT IS CLAIMED IS:

1. An ejector apparatus for forming an undercut portion in a molded piece, comprising:

a lift core extending through a core that constitutes a resin molding mold and installed so as to be movable in a longitudinal direction of the lift core with respect to a surface of the core;

an ejector plate arranged between the core and a base plate so as to be capable of moving up and down, the base plate being arranged below the core while being spaced apart from the core; and

an adjustment coupling constructed such that a lower end portion of the lift core is supported so as to be capable of expanding and contracting in a longitudinal direction of the lift core with respect to the ejector plate.

2. An ejector apparatus according to Claim 1, wherein the adjustment coupling is provided on an ejector plate side, the adjustment coupling comprising:

a support member which has an insertion hole allowing insertion of the lower end portion of the lift core, the insertion hole having a threaded portion, the lower end portion of the lift core inserted from one end of the insertion hole being supported on the ejector plate side;

an adjusting screw formed as a hollow cylinder having a threaded

portion on its outer peripheral surface and adapted to be threadedly inserted from the other end of the insertion hole of the support member to abut the lower end portion of the lift core;

a lock nut serving as a locking means; and

a bolt member for fastening together the adjusting screw and the lower end portion of the lift core.

3. An ejector apparatus according to one of Claim 2, wherein the adjusting screw and/or the lock nut has an inner hexagonal wrench hole.

4. An ejector apparatus according to one of Claim 2, wherein respective screws of the adjusting screw and the lock nut exhibit a screw fit length allowing locking without involving any stress relaxation due to fastening pre-tension.

5. An ejector apparatus according to one of Claim 2, wherein the adjusting screw and the lock nut each have a hexagonal wrench hole structure for a hollow hexagonal wrench with a round hole for fastening the lock nut and for a hexagonal wrench to be inserted into a hollow of the hollow hexagonal wrench with a round hole to fasten the adjusting screw, and

wherein the base plate and the ejector plate each have a space portion in which the hexagonal wrenches are turned around an axis

of the hexagonal wrench hole structure.

6. An ejector apparatus according to one of Claim 2, wherein the adjustment coupling is equipped with a clearance setting portion that serves to set a predetermined clearance in an axial length of the lift core through reversal of the adjusting screw by an amount corresponding to an angle that can be known from a pitch of the screw portion after abutting the adjusting screw against the lower end portion of the lift core.

7. An ejector apparatus for forming an undercut portion in a molded piece, comprising:

a lift core extending through a core constituting a resin molding mold, the lift core being installed so as to be movable obliquely with respect to a surface of the core and in a longitudinal direction of the lift core;

an ejector plate arranged between the core and a base plate so as to be capable of moving up and down, the base plate being arranged below the core while being spaced apart from the core;

a slide path formed in the ejector plate so as to extend in a direction in which a lower end of the lift core makes relative horizontal movement at a time of ascent and descent of the lift core;

a slide base movably arranged in the slide path;

a guide bush supported on the slide base so as to be pivotable in an inclining direction of the lift core; and

a guide rod that serves to force the slide base to slide horizontally by sliding along the guide bush at a time of ascent and descent of the ejector plate,

wherein the slide base is equipped with:

a slide base main body; and

an adjustment coupling constructed such that a lower end portion of the lift core is supported so as to be capable of expanding and contracting in a longitudinal direction of the lift core with respect to the sliding base main body.

8. An ejector apparatus according to one of Claim 7, wherein the adjustment coupling is provided on a slide base side, and is equipped with:

a support member which has an insertion hole allowing insertion of the lower end portion of the lift core, the insertion hole having a threaded portion, the lower end portion of the lift core inserted from one end of the insertion hole being supported on the slide base;

an adjusting screw formed as a hollow cylinder having a threaded portion on its outer peripheral surface and adapted to be threadedly inserted from the other end of the insertion hole of the support member to abut the lower end portion of the lift core;

a lock nut serving as a locking means; and

a bolt member for fastening together the adjusting screw and the lower end portion of the lift core.

9. An ejector apparatus according to Claim 7, wherein the adjustment coupling is constructed such that the lower end portion of the lift core is supported so as to be pivotable in the inclining direction of the lift core with respect to the sliding base main body in such a way that an inclination angle of the guide rod is the same as an inclination angle of the lift core.

10. An ejector apparatus according to one of Claims 9 through 5, wherein the adjustment coupling is provided on a slide base side, and is equipped with:

a support member which has an insertion hole allowing insertion of the lower end portion of the lift core, the insertion hole having a threaded portion, the lower end portion of the lift core inserted from one end of the insertion hole being supported on the slide base;

an adjusting screw formed as a hollow cylinder having a threaded portion on its outer peripheral surface and adapted to be threadedly inserted from the other end of the insertion hole of the support member to abut the lower end portion of the lift core;

a lock nut serving as a locking means; and

a bolt member for fastening together the adjusting screw and the lower end portion of the lift core.

11. An ejector apparatus for forming an undercut portion in a molded piece, comprising:

a lift core extending through a core constituting a resin molding mold, the lift core being installed so as to be movable obliquely with respect to a surface of the core and in a longitudinal direction of the lift core;

an ejector plate arranged between the core and a base plate so as to be capable of moving up and down, the base plate being arranged below the core while being spaced apart from the core;

a slide path formed in the ejector plate so as to extend in a direction in which a lower end of the lift core makes relative horizontal movement at the time of ascent and descent of the lift core;

a slide base movably arranged in the slide path;

an adjustment coupling constructed such that a lower end portion of the lift core is supported so as to be capable of expanding and contracting in a longitudinal direction of the lift core and rotatable in an inclining direction of the lift core with respect to the sliding base main body;

a guide bush supported on the slide base so as to be pivotable in an inclining direction of the lift core; and

a guide rod that serves to force the slide base to slide horizontally by sliding along the guide bush at the time of ascent and descent of the ejector plate,

wherein the adjustment coupling is endowed with an alignment function by which an intersection point where the guide rod and the core cross each other, an intersection point where the guide rod and the guide bush cross each other, an intersection point where the lift core and the core cross each other, and an intersection point where the lift core and the adjustment coupling cross each other, are capable of forming a parallelogram.

12. An ejector apparatus according to one of Claim 11, wherein the adjustment coupling is provided on a slide base side, and is equipped with:

a support member which has an insertion hole allowing insertion of the lower end portion of the lift core, the insertion hole having a threaded portion, the lower end portion of the lift core inserted from one end of the insertion hole being supported on the slide base;

an adjusting screw formed as a hollow cylinder having a threaded portion on its outer peripheral surface and adapted to be threadedly inserted from the other end of the insertion hole of the support member to abut the lower end portion of the lift core;

a lock nut serving as a locking means; and

a bolt member for fastening together the adjusting screw and the lower end portion of the lift core.

13. An ejector apparatus according to one of Claim 12, wherein respective screws of the adjusting screw and the lock nut exhibit a screw fit length allowing locking without involving any stress relaxation due to fastening pre-tension.

14. An ejector apparatus according to one of Claim 12, wherein the adjusting screw and the lock nut each have a hexagonal wrench hole structure for a hollow hexagonal wrench with a round hole for fastening the lock nut and for a hexagonal wrench to be inserted into a hollow of the hollow hexagonal wrench with a round hole to fasten the adjusting screw, and

wherein the base plate and the ejector plate each have a space portion in which the hexagonal wrenches are turned around an axis of the hexagonal wrench hole structure.

15. An ejector apparatus according to one of Claim 12, wherein the adjustment coupling is equipped with a clearance setting portion that serves to set a predetermined clearance in an axial length of the lift core through reversal of the adjusting screw by an amount corresponding to an angle that can be known from a pitch of the screw portion after abutting the adjusting screw against the lower



end portion of the lift core.

16. An ejector apparatus according to one of Claim 12, wherein the adjusting screw and/or the lock nut has an inner hexagonal wrench hole.

17. An ejector apparatus according to one of Claim 16, wherein the adjusting screw and the lock nut each have a hexagonal wrench hole structure for a hollow hexagonal wrench with a round hole for fastening the lock nut and for a hexagonal wrench to be inserted into a hollow of the hollow hexagonal wrench with a round hole to fasten the adjusting screw, and

wherein the base plate and the ejector plate each have a space portion in which the hexagonal wrenches are turned around an axis of the hexagonal wrench hole structure.

18. An ejector apparatus according to one of Claim 16, wherein the adjustment coupling is equipped with a clearance setting portion that serves to set a predetermined clearance in an axial length of the lift core through reversal of the adjusting screw by an amount corresponding to an angle that can be known from a pitch of the screw portion after abutting the adjusting screw against the lower end portion of the lift core.

19. An ejector apparatus according to one of Claim 16, wherein respective screws of the adjusting screw and the lock nut exhibit a screw fit length allowing locking without involving any stress relaxation due to fastening pre-tension.

20. An ejector apparatus according to one of Claim 19, wherein the adjusting screw and the lock nut each have a hexagonal wrench hole structure for a hollow hexagonal wrench with a round hole for fastening the lock nut and for a hexagonal wrench to be inserted into a hollow of the hollow hexagonal wrench with a round hole to fasten the adjusting screw, and

wherein the base plate and the ejector plate each have a space portion in which the hexagonal wrenches are turned around an axis of the hexagonal wrench hole structure.

21. An ejector apparatus according to one of Claim 19, wherein the adjustment coupling is equipped with a clearance setting portion that serves to set a predetermined clearance in an axial length of the lift core through reversal of the adjusting screw by an amount corresponding to an angle that can be known from a pitch of the screw portion after abutting the adjusting screw against the lower end portion of the lift core.